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STATEMENT

By

DR. JAMES C. FLETCHER

ADMINISTRATOR

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

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PITTSBURGH, OF COURSE, PLAYS A MAJOR ROLE IN OUR MANNED SPACE FLIGHT PROGRAM. ROCKWELL INTERNATIONAL, WITH ITS CORPORATE OFFICES HERE, IS THE PRIME CONTRACTOR BOTH FOR OUR APOLLO SOYUZ TEST PROJECT ACTIVITIES AND FOR THE SPACE SHUTTLE ORBITER. THESE TWO PROGRAMS, IN A SENSE, REPRESENT THE TRANSITION BETWEEN NASA'S PAST AND FUTURE -- BETWEEN A PERIOD OF EXPLORING OR FEELING OUR WAY TO A PERIOD OF EXPLOITATION OR PUTTING THIS NEW RESOURCE OF SPACE TO WORK FOR US.

OUR NEXT MANNED MISSION IS SCHEDULED FOR LAUNCH IN JULY, AND THE MAJOR OBJECTIVE OF THIS WILL BE TO RENDEZVOUS AND DOCK WITH AN ORBITING SOVIET SOYUZ SPACECRAFT WHICH WILL HAVE BEEN LAUNCHED SEVEN AND A HALF HOURS EARLIER. I AM PLEASED TO REPORT THAT OUR WORK AND THAT OF THE SOVIETS TOWARD THIS MISSION IS ON SCHEDULE, AND WE HAVE EVERY CONFIDENCE THAT THE MISSION WILL BE CARRIED OUT ON TIME.

IN FACT, OUR ASTRONAUTS FOR THE FLIGHT AND THE SOVIET COSMONAUTS TODAY ARE COMPLETING A JOINT TRAINING SESSION AT OUR JOHNSON SPACE CENTER IN HOUSTON. BOTH CREWS REPORT THAT

THEY ARE MAKING EXCELLENT PROGRESS AND THEY WORK WELL TOGETHER. THE APOLLO SPACECRAFT FOR THE FLIGHT WAS SHIPPED EARLIER THIS MONTH FROM THE ROCKWELL FACTORY IN DOWNEY, CALIFORNIA, TO THE KENNEDY SPACE CENTER IN FLORIDA.

WHILE THE MAIN OBJECTIVE OF THIS ASTP FLIGHT IS TO DEMONSTRATE THE CAPABILITY OF THE SPACECRAFT OF TWO NATIONS TO RENDEVOUS AND DOCK IN SPACE, IT ALSO WILL PERMIT US TO PERFORM SOME 27 SCIENTIFIC EXPERIMENTS, WHICH WILL ADD TO THE KNOWLEDGE GAINED IN OUR APOLLO AND SKYLAB PROGRAMS. ONE OF THESE EXPERIMENTS, CALLED THE ULTRAVIOLET ABSORPTION EXPERIMENT, IS BEING CONDUCTED BY DR. T. M. DONAHUE OF THE UNIVERSITY OF PITTSBURGH. THE INFORMATION COLLECTED WILL HELP US UNDERSTAND THE EVOLUTION AND PHYSICAL CHEMISTRY AND DYNAMICS OF THE UPPER ATMOSPHERE. THIS UNDERSTANDING, IN TURN, MAY GIVE US MORE INSIGHT INTO THE INTERACTION BETWEEN THE UPPER AND LOWER ATMOSPHERES AND ITS EFFECTS ON WEATHER. (IT ALSO IS EXPECTED TO CONTRIBUTE TO OUR UNDERSTANDING OF THE ENVIRONMENTAL EFFECTS OF HIGH ALTITUDE AIRCRAFT.)

ALMOST EVERYTIME I MEET WITH A GROUP OF NEWSMEN I AM ASKED THE QUESTION: "WHEN CAN A REPORTER MAKE A SPACEFLIGHT?" I CAN'T GIVE YOU A FIRM DATE, BUT IT MAY BE SOONER THAN MANY OF YOU THINK. WE ARE WORKING ON THE DEVELOPMENT OF THE SPACE

SHUTTLE WHICH WE FEEL WILL REALLY OPEN THE WAY TO ECONOMICAL SPACE ACTIVITIES. IN ADDITION TO OTHER BENEFITS OF THE SHUTTLE, SUCH AS REUSABILITY AND LOWER COST OPERATIONS, IT WILL BE ABLE TO CARRY PEOPLE OF ORDINARY GOOD HEALTH INTO AND BACK FROM EARTH ORBIT FLIGHTS. THIS DOES NOT MEAN THAT IN THE EARLY 1980s WE WILL BE SELLING TICKETS TO SPACE TOURISTS TO TAKE SIGHT-SEEING TRIPS -- IT WON'T BE THAT ECONOMICAL. BUT I CAN ANTICIPATE THAT FROM TIME-TO-TIME IT MIGHT BE POSSIBLE TO TAKE A POOL REPORTER INTO SPACE ON A "SPACE AVAILABLE" BASIS. WE ALREADY HAVE A SMALL FILE OF LETTERS FROM NEWSMEN WHO HAVE VOLUNTEERED OR REQUESTED TO BE CONSIDERED FOR A SPACE FLIGHT WHEN IT BECOMES POSSIBLE.

THE SHUTTLE REALLY IS THE KEYSTONE TO THIS COUNTRY'S FUTURE SPACE ACTIVITIES. IT WILL BE THE WORKHORSE LAUNCH VEHICLE AND SPACECRAFT, MUCH AS THE DC-3 WAS THE FIRST REAL AIRCRAFT WORKHORSE IN THE YEARS BEFORE, DURING AND AFTER WORLD WAR II. IT WILL BE USED NOT ONLY BY NASA BUT BY OTHER GOVERNMENT AGENCIES, INCLUDING THE DEPARTMENT OF DEFENSE, COMMERCIAL ORGANIZATIONS AND OTHER NATIONS. IT WILL BE CAPABLE OF CARRYING INTO ORBIT, AND BACK IF NECESSARY, ALL SORTS OF PAYLOADS EITHER MANNED OR UNMANNED. AND NOT ONLY WILL IT BE ABLE TO PLACE SATELLITES IN ORBIT, IT ALSO WILL BE ABLE TO RETRIEVE

SATELLITES FOR RETURN TO EARTH FOR REPAIR OR REFURBISHMENT, AND IT WILL PERMIT MAINTENANCE CREWS TO RENDEZVOUS WITH SATELLITES IN SPACE AND REPAIR THEM ON THE SPOT.

THERE HAVE BEEN RUMORS THAT INFLATION HAS BEEN PLAYING HAVOC WITH THE SPACE SHUTTLE COSTS AND SCHEDULE. TO BE SURE, INFLATION HAS BEEN GIVING US PROBLEMS, BUT I AM KEEPING CLOSE TABS ON THE PROGRAM AND I EXPECT THAT WE WILL BE ABLE TO KEEP COSTS WITHIN OUR ORIGINAL ESTIMATES AND PASS ALL OUR MAJOR MILESTONES ON SCHEDULE. WE HOPE TO CARRY OUT OUR FIRST HORIZONTAL ATMOSPHERIC TESTS WITH THE SHUTTLE IN 1977 AND TO TEST IT ON ORBITAL FLIGHTS IN 1979. IT WILL BE FULLY OPERATIONAL IN 1980.

ONE OF THE MOST USEFUL SATELLITES WE HAVE IN OPERATION RIGHT NOW IS OUR NEWEST WEATHER SATELLITE, SMS-1, LAUNCHED LAST MAY 17. SMS STANDS FOR SYNCHRONOUS METEOROLOGICAL SATELLITE. AND SYNCHRONOUS MEANS IT IS AT AN ALTITUDE -- 22,300 MILES -- WHERE IT ORBITS EARTH EXACTLY ONCE A DAY WHILE THE EARTH MAKES ONE COMPLETE REVOLUTION ON ITS AXIS. AS A RESULT, THE SATELLITE ALWAYS STAYS OVER THE SAME POINT ON THE GLOBE AND CAN ALWAYS SEE THE SAME GEOGRAPHICAL AREA. THUS IT CAN KEEP CONTINUOUS WATCH ON FAST-CHANGING STORMS, SUCH AS HURRICANES AND WEATHER SYSTEMS THAT PRODUCE TORNADOES, WHEREAS OTHER WEATHER SATELLITES LOOK AT ANY AREA ONLY EVERY 12 HOURS.

YOU MAY HAVE SEEN ON TELEVISION THE RECENT TIME-LAPSE PICTURES FROM SMS -- WE ARE RELEASING THESE DAILY TO THE NETWORKS -- TRACING HURRICANE FIFI. I HAVE HERE SOME EARLIER ONES SHOWING HOW SMS TRACKED CARMEN UP FROM MEXICO'S YUCATAN PENINSULA ACROSS THE GULF OF MEXICO TO THE LOUISIANA COAST. CONTINUOUS DAY-NIGHT SURVEILLANCE PROVED EXTREMELY USEFUL TO THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION AS THE BASIS FOR WARNINGS THAT KEPT DOWN THE LOSS OF LIFE AND PROPERTY

FROM THIS STORM. DR. NEIL FRANK, DIRECTOR OF NOAA'S HURRICANE CENTER IN MIAMI, SAID THAT, WITH THE HELP OF SMS, "WE HAD A SMALLER MARGIN OF ERROR FOR CARMEN THAN FOR ANY HURRICANE IN A VERY LONG TIME."

OUR NEWEST APPLICATIONS SATELLITE -- THE TERM WE USE FOR SPACECRAFT DEVOTED TO DEVELOPING TECHNOLOGY FOR VERY PRACTICAL USES SUCH AS WEATHER FORECASTING, COMMUNICATIONS, AND SURVEYING OUR NATURAL RESOURCES -- IS ATS-6, THE SIXTH IN A SERIES OF APPLICATIONS TECHNOLOGY SATELLITES, BUT MUCH MORE COMPLEX AND VERSATILE THAN THE EARLIER ONES. IT WAS LAUNCHED LAST MAY 30, ALSO INTO A GEOSYNCHRONOUS ORBIT.

BY CARRYING A BIG 30-FOOT UMBRELLA ANTENNA INTO SPACE, ATS-6 CAN RELAY HIGH-QUALITY TV PICTURES TO SMALL, INEXPENSIVE GROUND STATIONS HAVING ONLY 10-FOOT ANTENNAS. THUS IT CAN SERVE WIDELY SCATTERED COMMUNITIES THAT ARE DIFFICULT, OR TOO EXPENSIVE, TO REACH WITH LAND LINES, MICROWAVE, OR TV SATELLITES THAT REQUIRE BIG, COSTLY GROUND STATIONS. RIGHT NOW ATS-6 IS WORKING FIVE DAYS A WEEK TRANSMITTING EXPERIMENTAL EDUCATIONAL AND MEDICAL TV PROGRAMS TO SCORES OF ISOLATED COMMUNITIES IN ALASKA, THE ROCKY MOUNTAIN STATES, AND APPALACHIA. SOME 20 OTHER EXPERIMENTS BEING CONDUCTED WITH ATS-6 INCLUDE PROVIDING NAVIGATION COMMUNICATIONS WITH SHIPS AND PLANES IN THE BUSY NORTH ATLANTIC TRAFFIC CORRIDOR.

THE OTHER APPLICATIONS SATELLITE I WANT TO MENTION IS ONE WHOSE NAME MAY BE MORE FAMILIAR TO YOU: ERTS, WHICH STANDS FOR EARTH RESOURCES TECHNOLOGY SATELLITE. ERTS-1, LAUNCHED IN JULY 1972, AND DESIGNED FOR A LIFE OF ONE YEAR, IS NOW IN ITS THIRD YEAR, STILL SENDING DOWN PICTURES THAT ARE BEING USED BY GOVERNMENT AGENCIES, PRIVATE INDUSTRY, AND UNIVERSITY RESEARCHERS TO HELP US UNDERSTAND AND USE MORE WISELY OUR PRECIOUS NATURAL RESOURCES.

ERTS CIRCLES THE GLOBE 14 TIMES A DAY, SCANNING A SWATH OF EARTH'S SURFACE 115 MILES WIDE IN GREEN, RED AND TWO NEAR-INFRARED SPECTRAL BANDS. FROM A 567-MILE CIRCULAR, NEAR-POLAR, SUN-SYNCHRONOUS ORBIT, THE SATELLITE PASSES OVER ALMOST THE ENTIRE GLOBE EVERY 18 DAYS AND CAN VIEW EACH CLOUD-FREE AREA REPETITIVELY AT THE SAME LOCAL TIME OF DAY AND THUS AT THE SUN ANGLE.

IN ITS 26 MONTHS, ERTS-1 HAS RETURNED MORE THAN 100,000 PICTURES, INCLUDING IMAGERY WITH LESS THAN 30 PER CENT CLOUD COVER OF ALL THE UNITED STATES, AND THREE FOURTHS OF THE WORLD'S LAND MASSES AND COASTAL AREAS. THE IMAGERY IS NOT ONLY PROVIDED TO INVESTIGATORS AND TO SEVERAL GOVERNMENT AGENCIES, BUT IS PUT ON SALE TO ANYONE ANYWHERE THROUGH FEDERAL DATA CENTERS.

THE REPETITIVE MULTISPECTRAL IMAGERY OF EARTH TAKEN BY ERTS-1 HAS BEEN USED FOR SUCH WIDE-RANGING PRACTICAL PURPOSES AS:

- O MONITORING URBAN DEVELOPMENT AND PLANNING FUTURE LAND USE.
- O LOCATING AIR AND WATER POLLUTION.
- O MAPPING STRIP-MINE AND FOREST-FIRE SCARS.
- O LOCATING GEOLOGIC FORMATIONS THAT MAY INDICATE THE PRESENCE OF MINERALS AND PETROLEUM.
- O UPDATING MAPS AND NAVIGATION CHARTS.
- O ESTIMATING CROP ACREAGE.
- O MONITORING THE ADVANCE OF GLACIERS.
- O STUDYING FLOOD HAZARDS AND MANAGING OUR WATER RESOURCES.
- O HELPING TO LOCATE UNDERGROUND WATER SUPPLIES.

NOW WE ARE GETTING READY TO LAUNCH A SECOND ERTS, LATE THIS YEAR OR EARLY IN 1975, AND HAVE RECENTLY SELECTED 93 RESEARCH TEAMS IN FEDERAL, STATE, AND FOREIGN GOVERNMENTS, INTERNATIONAL ORGANIZATIONS, UNIVERSITIES, AND PRIVATE COMPANIES TO MAKE NEW STUDIES OF EARTH'S NATURAL RESOURCES AND MAN'S USE OF THEM IN 43 STATES AND 48 OTHER COUNTRIES.

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ANOTHER MAJOR RESPONSIBILITY OF NASA IS HELPING MAINTAIN UNITED STATES WORLD LEADERSHIP IN CIVIL AND MILITARY AVIATION, A POSITION NOW BEING THREATENED BY INCREASINGLY SERIOUS FOREIGN COMPETITION.

NASA AERONAUTICAL RESEARCH AND TECHNOLOGY PROGRAMS ARE BOTH BROAD IN SCOPE AND RESPONSIVE TO CHANGING NEEDS OF THE MULTI-BILLION DOLLAR U.S. INDUSTRY, AN INDUSTRY THAT CONTRIBUTES SOME THREE BILLION DOLLARS ANNUALLY TO THE U.S. BALANCE OF TRADE.

WITH THE SHORTAGE OF OIL AND THE RISING FUEL COSTS, NASA IS PLACING ADDITIONAL EMPHASIS ON THE FUEL CONSERVATION ASPECTS OF AIR TRANSPORTATION. FUEL COSTS FOR LONG HAUL AIR TRANSPORTS ARE THREE TIMES THE PRE-1973 LEVEL.

THE AERONAUTICAL TECHNOLOGY NASA HAS UNDER DEVELOPMENT AND PLANNED MAY PERMIT FUTURE AIRCRAFT TO USE ONLY TWO-THIRDS TO ONE-HALF AS MUCH FUEL PER AVAILABLE SEAT MILE AS THE AIRCRAFT THEY REPLACE.

WE BELIEVE THESE FUTURE AIRCRAFT WILL USE OUR SUPER-CRITICAL WING TECHNOLOGY TO REDUCE BOTH AIR DRAG AND STRUCTURAL WEIGHT; COMPOSITE MATERIALS FOR REDUCED WEIGHT AND INCREASED STRENGTH; FAST ACTING, COMPUTER COORDINATED CONTROLS FOR BOTH SMOOTHER FLIGHTS AND REDUCTIONS IN WEIGHT AND DRAG; AND SMALL WINGLETS MOUNTED AT THE WING TIPS TO REDUCE LIFT-INDUCED DRAG.

SIMILAR TECHNOLOGY ADVANCES WILL PROVIDE FOR FUEL-CONSERVATIVE ENGINES, A LARGE REDUCTION IN ENGINE SIZE AND WEIGHT, AND OVERALL EFFICIENCY GAINS TO PRODUCE AN EFFECTIVE FUEL-CONSUMPTION DROP OF 15 PERCENT OR MORE. ONE ENGINE CONCEPT, WHICH USES EXHAUST HEAT TO RAISE COMBUSTOR INLET TEMPERATURE, HAS THE POTENTIAL TO OPERATE WITH 30 PERCENT LESS FUEL THAN THE CURRENT TECHNOLOGY TURBOFAN ENGINE.

IN ADDITION TO THESE FUEL CONSERVATION CONCEPTS, NASA AND THE MILITARY SERVICES ARE EXPLORING THE USE OF SYNTHETIC HYDROCARBON FUELS AND THE USE OF LIQUID HYDROGEN OR POSSIBLY LIQUID METHANE AS ALTERNATE FUEL FOR BOTH SUBSONIC AND SUPERSONIC AIRCRAFT.

NEW APPROACHES TO FLIGHT OPERATIONS IN THE TERMINAL AREA WILL ALSO CONTRIBUTE TO FUEL ECONOMY . THESE INCLUDE STEEP,

CURVED APPROACHES; REDUCED SEPARATION DISTANCES BETWEEN OPERATING AIRCRAFT; FEWER HOLDS IN FLIGHT AND ON THE GROUND; AND IMPROVED ALL WEATHER OPERATIONS. APPROACH AND LANDING PROCEDURES WILL BECOME MORE PRECISE AND TIGHTLY SCHEDULED. NASA IS WORKING IN CLOSE COORDINATION WITH THE FAA AND INDUSTRY TO DEVELOP THE AIRCRAFT SYSTEMS TECHNOLOGY REQUIRED FOR THESE OPERATIONAL ADVANCES.

AND ONE MORE ITEM WHILE ON THE SUBJECT OF ENERGY, WE RECENTLY ESTABLISHED AT NASA HEADQUARTERS AN ENERGY PROGRAMS OFFICE TO MORE EFFECTIVELY SUPPORT THE FEDERAL AGENCIES RESPONSIBLE FOR ENERGY RESEARCH AND DEVELOPMENT. HERE, THE MANAGEMENT SKILLS AND NASA-DEVELOPED TECHNOLOGY FROM BOTH ITS AERONAUTICS AND SPACE PROGRAMS ARE BEING APPLIED TO THE CRITICAL ENERGY PROBLEMS FACING OUR NATION TODAY. THESE EXPERIMENTS IN THE FIELD OF ENERGY RUN THE GAMBIT FROM SOLAR HEATING AND COOLING OF HOMES AND OFFICE BUILDINGS, WIND ENERGY GENERATING SYSTEMS, REDUCING AIR DRAG OF TRUCKS AND AUTOMOBILES, INCREASING THE EFFICIENCY OF LARGE POWER STATIONS, DEVELOPING MODULAR INTEGRATED UTILITIES SYSTEMS FOR APARTMENT COMPLEXES, TO THE DEVELOPMENT OF ADVANCED MINERAL EXTRACTION TECHNOLOGY AND HELPING TO LOCATE VIA SATELLITE, NATIONAL MINERAL DEPOSITS, TO MENTION BUT A FEW.

IN A RELATIVELY SHORT PERIOD OF TIME, INTENSE ACTIVITY IN PLANETARY EXPLORATION IS PROVIDING US WITH A NEW PORTRAIT OF THE PLANETS, AND LITERALLY CHANGING THE TEXT BOOKS.

WE HAVE WITNESSED PIONEER 10, IN AN OUTSTANDING TECHNICAL PERFORMANCE, FLY BY JUPITER LAST DECEMBER AND RETURN A FASCINATING REPORT ON THAT GIANT PLANET AND ITS MOONS. WE NOW HAVE THE FIRST CONVINCING EVIDENCE THAT JUPITER IS INDEED A SWIRLING BALL OF LIQUID HYDROGEN WITHOUT ANY DETECTABLE SURFACE. AND WE HAVE LEARNED THAT THE GREAT RED SPOT, A MYSTERY SINCE MAN FIRST TURNED HIS TELESCOPES ON IT, IS THE VORTEX OF A GIGANTIC HURRICANE WHICH HAS BEEN RAGING ALONG A 25,000-MILE FRONT FOR AT LEAST 400 YEARS. WE HAVE LEARNED MORE ABOUT THE ATMOSPHERE, CLOUD STRUCTURE AND INTERIOR OF JUPITER FROM THE FLIGHT OF PIONEER 10 THAN FROM ALL THE OBSERVATIONS THAT WENT BEFORE.

A SISTER SPACECRAFT, PIONEER 11, IS EN ROUTE TO JUPITER FOR AN EVEN CLOSER LOOK AT THAT PLANET IN DECEMBER, BEFORE CONTINUING ON TO RINGED SATURN FOR OUR FIRST CLOSEUP LOOK AT THAT PLANET.

AT THE OPPOSITE END OF THE SOLAR SYSTEM, OUR ATTENTION HAS BEEN FOCUSED THE PAST WEEK ON THE SECOND VISIT OF MARINER 10 TO MERCURY ON SEPTEMBER 21ST. THIS IS THE SMALLEST PLANET IN THE SOLAR SYSTEM AND THE ONE CLOSEST TO THE SUN. PRIOR TO THE MARINER 10 MISSION, ALL THAT WAS REALLY KNOWN ABOUT MERCURY WAS THAT IT HAD AN UNUSUALLY HIGH DENSITY, AND THAT IT REVOLVED EXACTLY THREE TIMES IN EVERY TWO ROTATIONS ABOUT THE SUN. THE NEW KNOWLEDGE OF MERCURY, BASED ON MARINER DATA AND PICTURES, NOT ONLY PROVIDES US WITH A COMPLETELY NEW PICTURE OF OUR MOST ELUSIVE NEIGHBOR, BUT ALSO PROMISES TO SHED LIGHT ON MERCURY'S ORIGIN AND EVOLUTION RELATIVE TO THE EARTH.

LOOKING AHEAD, TWO VIKING SPACECRAFT ARE SCHEDULED TO SOFT LAND ON MARS IN 1976 TO SEARCH FOR LIFE; TWO MARINERS, WITH MORE SOPHISTICATED INSTRUMENTS THAN ANY OF THEIR PREDECESSORS, WILL BE LAUNCHED TO JUPITER AND SATURN IN 1977, AND TWO PIONEER SPACECRAFT WILL EXPLORE VENUS IN 1978. THESE SPACECRAFT WILL DROP PROBES INTO THE MURKY ATMOSPHERE OF VENUS, PROVIDING US WITH THE CLEAREST PICTURE YET OF CONDITIONS ON THAT CLOUD-SHROUDED PLANET.

ALL THESE ARE STEPS TOWARD OUR FUNDAMENTAL GOAL TO USE THE SOLAR SYSTEM AS A LABORATORY AND, BY COMPARISON, TO LEARN MORE ABOUT THE FUNCTIONING OF OUR OWN PLANET, ITS HISTORY AND ITS PROBABLE FUTURE.